2009 Earth Science Senior Review

National Interests Panel

Report to Senior Review Science Panel

Lawrence Friedl, Panel Chair
NASA Headquarters
ESD Applied Sciences Program

May 12-14, 2009

Earth Science Senior Review

National Interests Panel

*Overall Recommendations from National Interests Panel **		
Rating	**Definition**	**Missions**
Very High Utility	These missions have one or more very relevant and highly valued data products which are routinely used by one or more of the participating organizations for important activities. Loss of the data product(s) would have a significant negative impact on national on national agencies and organizations.	***Aqua, Terra, QuikSCAT, TRMM, Jason-1, GRACE***
High Utility	These missions have one or more data products which are routinely used by one or more of the participating organizations for their activities. Loss of the data product(s) would have a measurable negative impact on national agencies and organizations.	***Aura, CloudSat, SORCE***
Some Utility	These missions have one or more data products which are used by one or more of the participating organizations. Loss of the data product(s) would have a small but measurable negative impact on national agencies and organizations.	***EO-1, CALIPSO, ICESat, ACRIMSAT***
Not Applicable	These missions had no identified or significant applied or operational utility to the participating organzations. Loss of the data product(s) would have no or neglible negative impact on national agencies and organizations.	***None***

** Note: These are the initial findings and recommendations. The full report will explain the rationale for the ratings, including any caveats to these recommendations.*

Earth Science Senior Review

National Interests Panel

National Interests of the proposed mission extension

The National Interests panel assessed the contributions of the missions, sensors, and core data products to national objectives

Panel to convey the value of the missions and data sets for “applied and operational uses” that serve national interests, including:

- operational uses, public services, business and economic uses, military operations, government management, policy making, non-governmental organizations’ uses, etc.

Essentially, this panel represented users of the data sets for primarily non-research purposes.

Panel met April 28-29, 2009

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National Interests Panel

National Interests – Pre-panel Assessment Factors & Rating

Each organization assessed three primary factors and one overall rating:

Factor: Value

Overall value of the data products to the range of applied and operational uses within the organization. Value for those times the data is used, independent of frequency of use, latency of receipt, etc

Factor: Frequency of Use

Frequency the organization currently uses the data products in the range of applied and operational applications.

Factor: Latency

Current timeliness in which the organization accesses and/or receives delivery of the data products to meet the range of applied and operational uses.

Overall rating: Utility

Overall *utility* of mission and data products to national interests

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National Interests Panel

Panel Operations

35 minutes allocated for each mission (70 min. for Terra/Aqua/Aura)

Primary Reviewer introduced mission and his organization's ratings.
Showed table with all the organizations' ratings.
Round-table panel discussion.
Panel Consensus on an overall utility rating for the mission/sensor

- Identify any major minority opinions (for report)
- Determine any questions to suggest to Science Panel

Following discussions of all the missions, each organization separately ranked each mission according to its post-panel view of *national interests*

Primary Reviewers prepared Panel Summaries

Panel discussed overall results and recommendations

Panel Chair preparing panel report (early June delivery)

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National Interests Panel

Panel Members

Civil Agencies

Tom Carty	Federal Aviation Administration
Michael Cosh	US Department of Agriculture
Kevin Schrab	NOAA-National Weather Service
Al Powell	NOAA-NESDIS
Paul DiGiacomo	NOAA-CoastWatch

Military/Homeland Security

Kim Richardson	Naval Research Lab (Monterey)
Mark Zettlemoyer	Air Force Weather
Marty Eckes	Department of Homeland Security

States/NGOs/Private Sector

John Lyon	ASPRS
John Musinsky	Conservation International
Bill Burgess	National States Geographic Information Council
Rick Ohlemacher	AIAA & Space Enterprise Council Remote Sensing Working Group

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Panel Members

Observers

Interior/US Geological Survey
Federal Aviation Administration (support to Panel Member)
National Geospatial-Intelligence Agency
National Reconnaissance Office

Panel Member Cancellation

US Environmental Protection Agency

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National Interests Panel - Report

Rating	Definition	Missions
Very H		
Hig		
Sor		
Not A		

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Overall Utility Rating from National Interests Panel, by Organization & Mission/Sensor

Mission / Sensor	Overall Rating	Civil Agencies	Military / Intelligence Community	Homeland Security	State & Locals	Private Sector / NGOs
		NOAA				
ACRIMSAT						
Aqua						
AIRS						
AMSR-E						
CERES						
MODIS						
Aura						
HRDLS						
MLS						
OMI						
TES						
CALIPSO						
CloudSat						
EO-1						
GRACE						
ICESat						
Jason-1						
QuikSCAT						
SORCE						
Terra						
ASTER						
CERES						
MISR						
MODIS						
MOPITT						
TRMM						

National Interests Panel: TRMM

Panel Overall Utility Rating: Very High Utility

Organization Type	Organization	Individual Factors			Overall Utility Rating
		Value	Frequency of Use	Latency	
Civil Agencies	NOAA NWS	*High*	*Routine*	*NRT*	*Very High Utility*
	NOAA NESDIS	*High*	*Routine*	*1-2 Day*	*High Utility*
	NOAA CoastWatch	*High*	*Routine*	*1-2 Day*	*High Utility*
	FAA	*Medium*	*Indeterminate*	*Indeterminate*	*High Utility*
	USDA	*High*	*Routine*	*1-2 Day*	*Very High Utility*
Military / Intel. Comm.	DoD-NRL	*High*	*Routine*	*NRT*	*Very High Utility*
	DoD-Air Force Weather	*High*	*Routine*	*NRT*	*Very High Utility*
Homeland Security	DHS	*Low*	*Indeterminate*	*Indeterminate*	*Not Applicable*
State/Locals	NSGIC	*Indeterminate*	*Indeterminate*	*Indeterminate*	*Not Applicable*
Private Sector / NGOs	Conservation Intl.	*High*	*Routine*	*NRT*	*Very High Utility*
	ASPRS	*Medium*	*Occasional*	*Week/Month*	*High Utility*

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2009 National Interests Panel

*Overall Recommendations from National Interests Panel **		
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Very High Utility	These missions have one or more very relevant and highly valued data products which are routinely used by one or more of the participating organizations for important activities. Loss of the data product(s) would have a significant negative impact on national on national agencies and organizations.	***Aqua, Terra, QuikSCAT, TRMM, Jason-1, GRACE***
High Utility	These missions have one or more data products which are routinely used by one or more of the participating organizations for their activities. Loss of the data product(s) would have a measurable negative impact on national agencies and organizations.	***Aura, CloudSat, SORCE***
Some Utility	These missions have one or more data products which are used by one or more of the participating organizations. Loss of the data product(s) would have a small but measurable negative impact on national agencies and organizations.	***EO-1, CALIPSO, ICESat, ACRIMSAT***
Not Applicable	These missions had no identified or significant applied or operational utility to the participating organzations. Loss of the data product(s) would have no or neglible negative impact on national agencies and organizations.	***None***

** Note: These are the initial findings and recommendations. The full report will explain the rationale for the ratings, including any caveats to these recommendations.*

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Overall Utility Rating from National Interests Panel, by Organization & Mission/Sensor

Mission / Sensor	Overall Utility Rating	Civil Agencies					Military / Intelligence Community		Homeland Security	State & Locals	Private Sector / NGOs	
		NOAA NWS	NOAA NESDIS	NOAA CoastWatch	FAA	USDA	NRL	AWFA	DHS	NSGIC	Conservation Intl.	ASPRS
ACRIMSAT	Some	N/A	Some	N/A	N/A	N/A	High	N/A	N/A	N/A	N/A	N/A
Aqua	Very High	Very High	Very High	Very High	High	Very High	Very High	Very High	Some	Very High	High	Very High
AIRS/AMSU	*High*	*Very High*	*High*	*N/A*	*High*	*N/A*	*Very High*	*Very High*	*N/A*	*N/A*	*N/A*	*N/A*
AMSR-E	*High*	*Very High*	*Very High*	*Very High*	*Some*	*Very High*	*Very High*	*Very High*	*Some*	*N/A*	*N/A*	*N/A*
CERES	*Some*	*Very High*	*Very High*	*N/A*	*N/A*	*N/A*	*Some*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
MODIS	*Very High*	*Very High*	*Very High*	*Very High*	*High*	*High*	*Very High*	*Very High*	*Some*	*Very High*	*High*	*Very High*
Aura	High	Very High	Very High	N/A	High	N/A	High	High	Some	Some	N/A	Very High
HRDLS	*N/A*	*N/A*	*Very High*	*N/A*	*N/A*	*N/A*	*Some*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
MLS	*Some*	*Very High*	*Very High*	*N/A*	*Some*	*N/A*	*High*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
OMI	*High*	*Very High*	*Very High*	*N/A*	*High*	*N/A*	*Some*	*Very High*	*Some*	*N/A*	*N/A*	*Very High*
TES	*Some*	*N/A*	*N/A*	*N/A*	*Some*	*N/A*	*Some*	*Very High*	*N/A*	*N/A*	*N/A*	*N/A*
CALIPSO	Some	Some	Very High	N/A	Some	N/A	Very High	N/A	N/A	Some	N/A	Very High
CloudSat	High	High	High	N/A	Some	N/A	Very High	High	N/A	Some	N/A	Very High
EO-1	Some	Some	Some	N/A	N/A	Very High	High	N/A	Some	N/A	Some	Very High
GRACE	Very High	N/A	Very High	N/A	N/A	N/A	Some	N/A	Some	Very High	N/A	Very High
ICESat	Some	Some	Very High	N/A	N/A	N/A	Some	N/A	Some	Very High	N/A	Very High
Jason-1	Very High	Some	Very High	N/A	Some	Some	High	N/A	N/A	N/A	N/A	Very High
QuikSCAT	Very High	Very High	Very High	Very High	Some	N/A	Very High	Very High	N/A	Some	N/A	Very High
SORCE	High	High	Very High	N/A	N/A	N/A	Very High	High	N/A	N/A	N/A	N/A
Terra	Very High	Very High	Very High	Some	High	Very High	Very High	Very High	Some	Very High	Very High	Very High
ASTER	*High*	*N/A*	*High*	*N/A*	*Some*	*High*	*High*	*High*	*N/A*	*High*	*Very High*	*Very High*
CERES	*Some*	*Very High*	*Very High*	*N/A*	*N/A*	*N/A*	*Some*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
MISR	*Some*	*N/A*	*High*	*N/A*	*Some*	*High*	*High*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
MODIS	*Very High*	*Very High*	*Very High*	*Some*	*High*	*Very High*	*Very High*	*Very High*	*Some*	*Very High*	*Very High*	*Very High*
MOPITT	*Some*	*N/A*	*High*	*N/A*	*N/A*	*N/A*	*High*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
TRMM	Very High	Very High	High	High	High	Very High	Very High	Very High	N/A	N/A	Very High	High

Post-Panel Discussion Ranking of Missions						
Mission	Overall Score	Average	Stnd Dev.	Range		Panel Utility Rating
				High	Low	
Aqua	*149*	*12.4*	*0.79*	13	11	Very High
Terra	*138*	*11.5*	*1.62*	13	8	Very High
QuikSCAT	*107*	*8.9*	*2.64*	13	5	Very High
TRMM	*98*	*8.2*	*3.66*	12	2	Very High
Jason-1	*90*	*7.5*	*3.06*	12	2	Very High
Aura	*87*	*7.3*	*2.38*	10	3	High
GRACE	*82*	*6.8*	*3.27*	11	2	Very High
EO-1	*69*	*5.8*	*3.72*	11	1	Some
CloudSat	*64*	*5.3*	*2.02*	9	2	High
CALIPSO	*64*	*5.3*	*2.84*	11	1	Some
SORCE	*61*	*5.1*	*3.50*	12	1	High
ICESat	*51*	*4.3*	*2.60*	8	1	Some
ACRIMSAT	*32*	*2.7*	*1.92*	6	1	Some

Post-Panel Discussion Utility Rating of Missions, by Organization

Panel	ASPRS	NOAA NESDIS	NRL	NOAA NWS	Conservation Intl.	AIAA	NSGIC	USDA	AWFA	USGS	NOAA Coast Watch	FAA	DHS
Aqua	Aqua	Aqua	Aqua	QuikSCAT	Terra	Aqua	Terra	Terra	Aqua	EO-1	Aqua	Aqua	Terra
Terra	Terra	Terra	Terra	Jason-1	TRMM	SORCE	Aqua	Aqua	TRMM	Terra	QuikSCAT	Terra	Aqua
QuikSCAT	CALIPSO	Jason-1	TRMM	Aqua	Aqua	EO-1	GRACE	TRMM	QuikSCAT	Aqua	Jason-1	TRMM	EO-1
TRMM	GRACE	QuikSCAT	QuikSCAT	Terra	SORCE	GRACE	QuikSCAT	EO-1	Terra	Aura	TRMM	Aura	GRACE
Jason-1	Aura	GRACE	CloudSat	TRMM	QuikSCAT	QuikSCAT	Aura	Jason-1	SORCE	ACRIMSAT	Terra	CALIPSO	Aura
GRACE	EO-1	TRMM	Jason-1	Aura	EO-1	Terra	Jason-1	ICESat	Aura	ICESat	ICESat	CloudSat	Jason-1
Aura	ICESat	SORCE	Aura	SORCE	GRACE	TRMM	CALIPSO	Aura	CloudSat	CALIPSO	CALIPSO	QuikSCAT	ICESat
CloudSat	QuikSCAT	ACRIMSAT	CALIPSO	CloudSat	Aura	Aura	CloudSat	GRACE	Jason-1	GRACE	GRACE	ICESat	ACRIMSAT
SORCE	CloudSat	CloudSat	SORCE	ICESat	CloudSat	Jason-1	EO-1	QuikSCAT	CALIPSO	SORCE	EO-1	SORCE	QuikSCAT
EO-1	Jason-1	CALIPSO	EO-1	CALIPSO	CALIPSO	ACRIMSAT	SORCE	CALIPSO	GRACE	TRMM	CloudSat	GRACE	CloudSat
CALIPSO	TRMM	Aura	ACRIMSAT	EO-1	ICESat	ICESat	ACRIMSAT	CloudSat	EO-1	Jason-1	Aura	EO-1	TRMM
ICESat	ACRIMSAT	ICESat	ICESat	GRACE	Jason-1	CloudSat	TRMM	ACRIMSAT	ICESat	QuikSCAT	SORCE	Jason-1	CALIPSO
ACRIMSAT	SORCE	EO-1	GRACE	ACRIMSAT	ACRIMSAT	CALIPSO	ICESat	SORCE	ACRIMSAT	CloudSat	ACRIMSAT	ACRIMSAT	SORCE

Very High	*High*	*Some*	*Not Applic./Neglig.*

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Individual Missions

2009 Senior Review – National Interests

Aqua: Very High Utility

Rationale

Loss of data from Aqua would have some significant negative impact on ALL organizations in the panel. Widespread use of MODIS alone ensures highest rating; AMSR-E and AIRS/AMSU also important and CERES' value recognized.

Ratings

Eight rated Terra Very High; One High; One Some

Uses

AMSR-E: Numerical weather prediction, defense trafficability, sea ice, TC location/structure/track; rain estimates for active/global TCs; operational marine forecasts; wind and wave conditions over open ocean;

AIRS/AMSU: Importance/utility widely noted but not all orgs use the data. Of significant importance to aviation community (SO2, volcanic plumes); volcanic ash detection in Rapid Update Cycle Rapid Refresh Model. Also used in NWP.

MODIS: Supports diverse atmospheric, oceanic, and terrestrial applications.
"Well received across the board in terms of both its quality and utility for user-drive applications and operations"
"MODIS data is most widely & broadly used data in NOAA"
- Air Force Weather: Tropical Cyclone analysis, dust/smoke detection
- USDA: Strategic wildland fire management
- Emissivity product used as boundary condition in NOAA GFM
- Polar winds used in oper. systems by 11 num. wx. pred. centers in 7 countries
- HAB Bulletins and Fisheries ecosystem assessments

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Aqua: Very High Utility

Rationale

Loss of data from Aqua would have some significant negative impact on ALL organizations in the panel. Widespread use of MODIS along ensures highest rating; AMSR-E and AIRS/AMSU also important and CERES' value recognized.

Sensors

MODIS	**Very High Utility**
AMSR-E	**Very High Utility**
AIRS/AMSU	**High Utility**
CERES	**Some Utility**

Comments

Proposal could have been much stronger in terms of Aqua's contributions to applications, as there were many areas that were not well addressed (e.g., coastal management, public health, ecological forecasting, water management),

The near-real time processing effort by NASA has made extremely useful contributions to applied and operational uses

USDA prefers Terra/MODIS to Aqua/MODIS due to AM pass (fewer clouds)

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Terra: Very High Utility

Rationale

Easily reached consensus rating of Very High Utility, primarily due to the great practical utility of MODIS for a wide range of applications. Value of other sensors, especially ASTER (despite loss of SWIR), added to utility rating.

Ratings

Nine rated Terra Very High/High; Two rated it Some

Uses

ASTER used for numerous applications by state/local governments: landscape change, unpermitted construction, disasters, watershed assessment, etc.

AST14 used NRT for Indonesia parks for illegal logging/encroachment alerts

CERES value for general climate applications; global weather forecast models

MODIS: Extraordinary array of applications
- Alert system warnings of fires in areas of high biodiversity importance
- State/locals: guides *in situ* sampling, smoke impacts, wildfires, base maps, …
- Flood inundation mapping, volcanic ash dispersion
- Aviation weather: clouds, cloud properties, convective initiation
- USDA prefers Terra over Aqua due to morning pass & less clouds; boosts classification for cropland data layer program - used operationally in 24 states
- World Ag. Outlook Board uses as part of drought monitoring

Other Views

NOAA CoastWatch ocean color is only risk redux for Aqua, MERIS

Utility of ASTER limited by difficulties in tasking and accessing data

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Terra: Very High Utility

Rationale

Easily reached consensus rating of Very High Utility, primarily due to the great practical utility of MODIS for a wide range of applications. Value of other sensors, especially ASTER (despite loss of SWIR), added to utility rating.

Sensors

MODIS	**Very High Utility**
ASTER	**High Utility**
CERES	**Some Utility**
MISR	**Some Utility**
MOPITT	**Some Utility**

Comments

Loss of ASTER SWIR led panel to lower its ranking down to High.

Satellite tasking and data availability could be improved, particularly ASTER.

Loss of MODIS rapid response data would drop utility rating by many on panel

If DAS Modulator on MODIS fails (sensor has lost redundancy), it would have a significant impact on the utility of this mission by nearly all panel participants.

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QuikSCAT: Very High Utility

Rationale	Breadth of disciplines that use QuikSCAT and multitude of applications Very High also since data available on reliable basis in near-real-time
Ratings	Half rated QuikSCAT Very High; None High; Half rated Some/Not Applic.
Uses	All 5 of NOAA's Mission Goals have ocean vector winds priority 1 (mx critical) Gap winds events (and climatologies for gap winds analysis) Tropical cyclone recon., formation/dissipation, center fixing/tracking, intensity Marine forecasts and at-sea wind warnings (gale- and storm-force wind events) Hurricane force warnings (ASCAT and WindSat have limited use for this) Use in fisheries forecasts, coral reef bleaching conditions Identification of first/multi-year ice, ice melt, and freeze-up areas; iceberg track Internationally used in operational data assimilation and weather forecasting Support for Intl. Space Station emergency landing sites (Soyuz/Orion)
Other Views	No direct use in many orgs., and all recognized it as a needed national asset

Note: Question about ability to get winds closer to coast; very desirable by applied/oper. orgs.

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TRMM: Very High Utility

Rationale	Tremendous use for each of TRMM's sensors and data products.
	Primary benefits with Tropical Cyclones (TC), flood, hazardous weather, fires, hydrology, forecast modeling
	Synergies with data sets from other satellites support additional applications
Ratings	Most of panel (9) has TRMM at Very High or High; not applicable by others
Uses	TC location and structure at NWS and DOD Joint Typhoon Warning Center, especially when TC circulation center not visible in geostationary imagery
	Rainfall monitoring and impacts of land-falling TCs; Precipitation forcing to hydrologic operations; US & overseas modeling agencies assimilate TMI, VIRS
	LIS lightning helps FAA, NOAA, Air Force monitor growth and decay of storms; supports aircraft icing conditions; NCEP Aviation Weather Center uses
	CI's NRT Fire Risk System uses TRMM daily in forest flammability; 3B42RT in rainfall duration & 3B42 for historical analysis of fire risk; pair with MODIS
Other Views	Two panelists indicated no direct TRMM use in their organizations, though they realized they may derived indirect benefits from better forecasts
	Panel lamented that TRMM's inclination limits coverage to tropics & lower US

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Jason-1: Very High Utility

Rationale	Data products central to oceanographic & weather communities, but reduced utility for other communities. Thus, lower of those in Very High category.
Ratings	Half considered Jason-1 Very High or High; Half considered Some/Not Applic.
Uses	Hurricane intensity forecasts Wave-height conditions/forecasts; warnings to mariners Habitats (fronts, eddies) that large pelagic animals use; larval transport models USDA uses in global Reservoir/Lake monitoring for water storage assessment Combination with Jason-2 (increased spatial coverage) had particular appeal for potential applications (but specific apps. are yet to be determined) Climate studies and SSH seasonal/interannual variability Synergies with other satellites' data sets (e.g. GRACE, MODIS, QuikSCAT)
Other Views	USDA has transitioned to Jason-2 data product, so value of Jason-1 is reduced If Jason-2 can support new NGS geoid, value of maintaining Jason-1 is less

Note: This mission had the most contentious debate within the panel (High vs. Very High).
Question about skills/abilities to estimate rivers and river discharge (section 1.5.3).

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GRACE: Very High Utility

Rationale	Very High due to mapping and charting that provide indirect benefits to all the organizations. However, most agencies do not use the data directly. New American vertical datum critical to mapping applications & land surveys
Ratings	Three rated GRACE Very High; Two Some; Half rated Not Applic.
Uses	National Geodetic Survey (NGS) – implementing new gravimetric national reference system (geoid vertical datum) by 2017; datum updated approx. once each decade and entire community relies on consistent refrence standards States currently implementing height modernization programs with NGS and dependent on derivative products produced by NGS GRACE data supported JB2008 density model [accepted at 2008 COSPAR Scientific Assembly] so data supports updates of this standard, which contributes to space protection (satellite orbits, debris collision risks) NWS testing GPS-RO data for operational data assimilation at NCEP Combination GRACE and Jason support sea level rise
Other Views	No direct use in most orgs; if NGS wasn't doing new vertical datum the utility would have been lower

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Aura: High Utility

Rationale	Rating primarily reflects use in volcanic ash advisory. Where MLS is used operationally, it is high utility. Air Quality aspects were underrepresented on panel.
Ratings	Half rated Aura Very High/High; Half rated Some/Not Applic.
Uses	Volcanic activity and ash detection. Volcanic cloud forecasting (especially in combo with AIRS plume detection); information used in real-time by Volcanic Ash Advisory Centers Assimilated in Global Forecast Model as additional source of ozone profile Use in monitoring stratospheric ozone; MLS especially valuable in polar regions NCEP currently testing assimilation of OMTO3 total ozone NRT product
Other Views	If the Aura data sets were made available more near real time, their use for forecast models and the use of trace gases would progress farther than it has. The proprietary-like nature of KNMI control of OMI data was lamented

Note: Utility may be bias low due to cancellation of EPA representative on panel and their air quality perspectives

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Aura: High Utility

Rationale

Rating primarily reflects use in volcanic ash advisory. Where MLS is used operationally, it is high utility.

Air Quality aspects were underrepresented on panel.

Sensors

OMI	**High Utility**
TES	**Some Utility**
MLS	**Some Utility**
HRDLS	**Negligible Utility/Not Applicable**

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CloudSat: High Utility

Rationale	Variety of useful applications for weather/clouds; though only a few vocal orgs.
	Near-real-time data needs and utility very useful where demonstrated, but latency needs to be improved for real utility for other users.
Ratings	Five rated CloudSat Very High/High; Two Some; Four rated Not Applic.
Uses	NRL using operationally in near-real-time; physical improvement of models' ability to predict light rain
	Air Force Weather using for cloud characterization to refine cloud analysis and forest algorithms; validate/calibrate cloud forecast models
	Vertical cloud structure, cloud development. NESDIS said the parameters are important but 'second tier'
	Cloud layers & height for modeling/forecasting support; support to aviation wx
	Also cited was support to water/energy cycle, aerosols, climate variability; often it is research results feeding operations
Other Views	Limited value to some orgs. (unavailability and unfamiliarity using the products)
	Synergy with A-Train (AMSR, MODIS) promotes utility of products
	Air Force Weather would use in operational forecasting if available in NRT

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SORCE: High Utility

Rationale	Based on recognition of the value for Space Weather & Protection capabilities, including the indirect benefits that all users of satellite data products derive from better space weather forecasts. Also, for contributions to climate change
Ratings	Ranged from Very High/High for 4; not directly applicable for others
Uses	Directly used by organization do space weather forecasting, especially near-real-time monitoring of solar flare events, inputs to USAF modeling, value and uses for airlines (arctic routing, personnel/passenger safety) Value is also as a back-up to primary GOES XRS sources; NESDIS plans to use SORCE XPS if GOES-14 not available when GOES-10 is shut down Contributions to climate records (though no specific application identified)
Other Views	Few organizations directly use the data products; they recognized the value they derive from protection of the satellites they are more interested in SORCE was more of interest than ACRIMSAT, primarily because of XPS and SIM/spectral

Note: There was a question whether part of SORCE (e.g., XPS) could be extended and funded, if the entire mission cannot.

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EO-1: Some Utility

Rationale	Utility of data high for knowledgeable users, though most had no use currently. If data was more available and tasking easier, rating could be high/very high.
Ratings	Three rated EO-1 Very High/High; 4 rated Some; 4 rated Not Applic.
Uses	Some applications: Crop residue, post fire-burn severity mapping; forest health; tornado path identification; flooded area NESDIS uses for special events: fires, volcanic eruptions. Use as a validation point in algorithm development projects USDA uses for research purposes; USFS uses data for post-fire burn severity mapping and assessment Significant contributions are no-cost-to-customer availability and on-board data processing
Other Views	Many panelists cited difficulty in gaining access to taskings and inability to gain access to data. Need for an operational level data stream in formats useable to customers Desire for increased transparency in tasking of EO-1

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CALIPSO: Some Utility

Rationale Current user community has limited application of the data products. Narrow swath and latency makes data primarily of use for scientific development.

Rating impacted by difficulty getting data in timely fashion and data format

Ratings Three rated CALIPSO Very High; Three Some; Half rated Not Applic.

Uses …here; use in

> "We would have used it if we had had it"
>
> - NRL Representative

…e ultimate applied

Other Views Data format not easy to use; half orbit increments was noted as inhibitor to applying the data (proposals efforts to improve that were welcomed)

Latency limits use (needs to be under 3 hours for most operational apps.)

Narrowness of swath inhibits use in operations except to parameteritize models

Note: Utility may be bias low due to cancellation of EPA representative on panel and their air quality perspectives

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ICESat: Some Utility

Rationale	Use is primarily by research arms of the organizations (e.g., validation efforts). Utility for applied & operational uses yet to be established.
	If data was more routinely collected and available or coverage extended, overall utility would be higher.
Ratings	Three rated ICESat Very High/High; Three Some; Half rated Not Applic.
Uses	Some measurements and products might offer value in carbon issues related to biomass and forest characteristics
	Some saw value for carbon budget issues (e.g., canopy height and structure); US Forest Service has used in part of effort o quantify woodland resources
	Some sense of utility for climate change and trends
	Some indications that intelligence community uses data products
Other Views	No direct use in most orgs
	Limited timeframes of data collection limit use of ICESat

2009 Senior Review – National Interests

ACRIMSAT: Some Utility

Rationale	No direct operational uses of ACRIMSAT identified by panel. Panel agreed on Some Utility based on premise that TSI was important for climatology studies and desire for multiple satellites recording overlapping data provides a better understanding of variances
Ratings	Ranged from Some/High for 2; not directly applicable for all others
Uses	NRL Solar Operations said High value but no specific uses identified NOAA accesses archived data for various uses, such as understanding energy balance of the earth, supporting near-real time insolation products, and climate applications Research “uses” mentioned (e.g., studying solar energy variations on climate) Contributions to climate records (though no specific application identified)
Other Views	Some panelists (NESDIS, NRL) mentioned interest in TSI over complete solar cycle – this seemed more a research interest; no application of that specific info

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Overall Findings

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Overall Findings

Overall sense of utility is biased low

- Secondary/tertiary users aren't necessarily aware how they indirectly use the mission data products

Where does research end and applied/operational uses begin

- Does use by researchers at operational agency for applied-oriented improvements constitute research or applied/operational uses?

NRT aspects of missions made significant differences in use & utility

Frustration about tasking and acquisition

- Have become use to standard data products and delivery
- Tasking/Access issues with EO-1, ASTER
- Access/Latency issues with CALIPSO, CloudSat, ASTER

Some overall ratings represent very vocal, invested communities, even though the data products may not be used widely

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Overall Findings

Combination of data products adds significantly to utility

Some examples:

- TRMM & AMSR-E: Fire risk & forest flammability
- Jason & GRACE
- ASTER and MODIS for thermal anomalies
- CloudSat (track on top) and AMSR-E (background) – tropical cyclones
- Jason with MODIS and QuikSCAT – tropical cyclones
  and sometime with TRMM overlayed on top also
- SORCE and GOES

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Back-up Materials

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1) Enable NASA to take into account the views of organizations (agencies, private sector, NGOs, etc.) that use the NASA satellite data products for applied and operational uses in the national interest

2) Gather organizations' individual and collective comments and recommendations for NASA on the satellite missions

3) Provide an opportunity for organizations to learn about additional data products they might exploit and to learn about uses by other organizations working in the national interest

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National Interests – Pre-panel Assessment Factors

Each organization assessed three primary factors and one overall rating:

Value of the Data Product (independent of other factors)

-- Very High
-- High
-- Medium
-- Low

Frequency of Use

-- Routine (daily to weekly)
-- Occasional (few times a month)
-- Rarely (few times per year or less)
-- Never

Latency (the current access/delivery of the product)

-- Near Real Time
-- Within 24-48 hours
-- Weekly/Monthly
-- Archival